3. Work on telegraphy without wires in 1899.

Experiments on the Kronstadt Raid.

The third year of work in telegraphy without wires is especially distinguished by the results obtained during its course. Starting this year, A. S. is relieved of his duties in Nizhny Novgorod and, without interruption, conducts telegraph work without wires.

Even in the winter of 1898, it was decided to continue the summer experiments, and forts of the Kronstadt fortress were outlined as the most convenient points for them. The Main Engineering Directorate favorably permitted experiments on them, and the chief of the serf telegraph b. Captain D. S. Troitsky expressed a desire to take a personal part in the experiments. The nearest winter were the stations at Fort Konstantin and at the Marine Telegraph at a distance of 3 versts, and between them the test of the receiving station, which was being developed by Kolbasyev's workshop, was begun. In the spring, A. S. was sent abroad, and the preparations for the coming summer were entrusted to me and D. S. Troitsky.

At the very beginning of these experiments, the ability to receive signals on the telephone was discovered. This discovery was of great importance for further work, and therefore it is necessary to dwell on it in more detail.

It was decided to concentrate the first preparatory experiments on Fort Konstantin, where there was a convenient mast, and on the nearest fort Milyutin. In these first experiments, it took a lot of time to study the wiring of the sending wire, to detect the influence of neighboring objects, to find the best connection to the ground, and all this made all kinds of tests too complicated.

On May 26, 1899, as recorded in our work journal, batteries were charged at the Konstantin station and appliances for the receiving station were brought.

On May 27, cold weather with rain stopped the experiments.

On May 28, the receiving station was transferred to Milyutin Fort.

The receiving wire, which allowed the mast to lift 6½ soot, delivered too little energy for the sensitive tube, and the relay of the receiving station did not respond to pulses sent from Fort Konstantin.

First of all, I had to check the operability of the receiving circuit, and with this attempt, the telephone entered instead of the relay, completely distinctly detected all the signals sent.

However, the conditions of the experiment were too complicated to be able to find out the reason for the discovered fact the first time. The forts of the fortress were connected by an underwater cable and it could influence the transmission. To repeat the experiment in simpler conditions, on May 31 a boat with a small mast was prepared. Before departure, the boat stood in front of Fort Konstantin, near the departure station, and when everything was ready, an attempt was made to repeat the previous experiment. This attempt ended in complete failure, the phone this time did not detect a single signal. The trip was postponed.

So, under two different conditions, the experiments yielded opposite results. The only thing left to explain the failure of the second experiment was that in this experiment the energy acting on the sensitive tube was too great.

The experiment made on June 1 at the Mine Class Physical Cabinet fully confirmed this assumption.

Two spirals in turn sent signals. One spiral worked for a small spark, the other for a large one, and the telephone receiver, placed at the end of the room, detected only signals sent by low energy.

So a random fact revealed a new property of the sensitive tube built by A. S. This tube, it turns out, also changes resistance from weak impulses, but insignificantly, so that it does not lose the ability to receive the next impulse. Only under these conditions it is possible to do without a shaker and detect sent vibrations to the phone.

The sensitivity of the new method of reception was soon once again confirmed by experience, on June 11 the first signals were received at a distance of 25 versts between Fort Konstantin and the village of Lebyazhye. In this experiment, the receiving wire was lifted using a kite.

On the 14th of June A.S. returned and the tests began on a large scale. By this time, the destroyer 115, specially designated for experiments, was already under command b. Lieutenant Kolbasyev. The main coastal station was still Fort Konstantin.

The work began with a test of a receiving station of the type of 1899, then developed by Kolbasyev's workshop. This station had a relay with a movable winding and a sensitive tube model 98 years. This combination was not particularly successful and gave a small range of about 3 versts. More successful was the test of the departure station, operating from the Venelt interrupter. The starting wire of this station, raised with the help of a snake, easily gave a significant range of 35 versts for that time. With this experience, one of the features of a telephone receiver was discovered. It turned out that the telephone clearly heard with what frequency the interrupter of the sending station works, which sometimes makes it possible to find out which station is telegraphing.

These experiments were interrupted by a rather important event. On August 12 of this year, the first three complete stations developed by Ducreta arrived; and on August 14, an order was received to test these stations on the ships of the Black Sea Fleet.

I consider it necessary to end the description of the period under analysis with a short excerpt from the letter from A. S., which describes several of the results of his first trip abroad:

"Paris 1/13 June ..... I ordered 5 spirals and three complete stations at Ducreta in different places. I saw and found out everything that I could. I spoke with Slaby and saw his instruments, I was at Blondlo's station in Boulogne , in a word, I found out everything that is possible and I see that we are not very far behind the others. I hope for good results with Ducrethe stations ...... "

The first experiments in the Black Sea took place from August 19 to September 11, 1899. We arrived two days before the maneuvers of the Black Sea Squadron. During these days, three stations were distributed on the battleships "George the Victorious", "Three Saints" and "12 Apostles". During the course of the squadron, it was necessary to get acquainted with the devices just obtained, it was necessary to establish and, if possible, test them in a combat situation during maneuvers. Upon returning the squadron to Sevastopol for experiments at a great distance from the raid sent the Saken mine cruiser.

The main features of the first type of Ducrethe receiving station were its sensitive tube and relay. The French coherer was very sensitive at that time. It consisted of two nickel electrodes, between which nickel, pre-oxidized, sawdust was poured. The design of the coherer allowed the use of a very small number of sawdust, which was of great importance for increasing the sensitivity of the device. These receiving stations gave the longest range of 9 miles. Telegraph stations were usually located on the looser part of the ship — on the Utah, with an ordinary conductor rising to one of the nearest masts.

Kolbasiev, Schigolev and Schreiber took part in the described experiments.